SECTION 01 78 30.00 23

CADD DATA FOR GIS DELIVERABLES
09/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

THE CAD/BIM TECHNOLOGY CENTER FOR FACILITIES, INFRASTRUCTURE, AND ENVIRONMENT (USACE)

ERDC/ITL TR-09-2 (2012) A/E/C CAD Standard, Release 5.0

ERDC/ITL TR-04-1 (2004) CAD Details Library

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation for submittals found in RFP PART 2. Additional construction submittals reserved for Government approval are listed in the section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES. Submittals with a "G" designation found in the sections used by the Contractor to create construction specification, require DOR approval. DOR approved submittals are also listed in the "CONSTRUCTION SUBMITTALS" paragraph in each RFP PART 4, Performance Technical Specifications. Submit the following in accordance with section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Record Drawings; G

SD-11 Closeout Submittals

CADD Data; G

Survey Report; G

Survey Control Database; G

Underground Utility Location Plan; G

Non-Disclosure Letter; G

1.3 GENERAL REQUIREMENTS

This section provides the requirements for georeferenced CADD data.

The requirements of this section are limited to the boundaries indicated on the site plan. If no separate boundary is indicated on the site plan then the limits of the CADD data deliverable submitted as part of this

specification section will be considered the Limit of Disturbance.

1.4 OWNERSHIP

All digital files, final hard-copy products, source data acquired for this project, and related materials, including that furnished by the Government, will become the property of the Government and shall not be issued, distributed, or published by the Contractor.

1.5 GOVERNMENT PROVIDED INFORMATION

The Government will provide access only to information pertinent to the Contract. This information, which may include but is not limited to geospatial mapping data in GIS or CADD format, reports, and schematics, will be provided through the Navy regional GeoReadiness Center (GRC). All geospatial mapping data provided shall require a signed non-disclosure letter from the requester and all entities including sub contractors who will require the data. A copy of the non-disclosure letter and data request form will be provided by the Navy regional GeoReadiness Center.

1.6 DATA COLLECTION PROCEDURES

1.6.1 Field Data Collection

Data shall be collected employing conventional and other methods, such as Total Station, or Global Positioning System (GPS) in accordance with the applicable Geospatial Positioning Accuracy Standards.

1.6.1.1 Location of Utility Lines and Other Features

a. Surveyed data on the location of utility lines including, but not limited to, potable water pipelines, wastewater and storm-sewer water pipelines, electrical conduits and lines, grounding rods and cables, telephone lines, CATV fiber-optic lines, and various process pipelines, shall be captured at a minimum every 50 feet and at each turn or bend in the line, and processed as a line feature type.

b. Surveyed data on the location of utility points and other features shall be captured at the centroid of the feature unless signal obstruction or access prohibits; otherwise, points will be captured at a uniform distance and direction from the centroid.

c. Surveyed data on polygon (area) features shall be collected at every vertex of the feature and processed as a contiguous polygon.

Capture vertical data indicating the top and invert elevations of manholes, catch basins, headwalls, finished floor of buildings, top of slabs, top of curbs, invert of dikes, and other elements, with an accuracy of 0.1 feet.

Topography shall be provided at 1.0 foot contour intervals.

The Contractor shall locate all sub-surface utilities prior to backfilling.

1.6.1.2 Horizontal Accuracy level

Provide at a minimum, High Accuracy Mapping-Grade GPS collection at an accuracy level of plus or minus 0.5 feet using differential correction.

GPS data collection activities must be based on a post-processed environment using an accurately sighted base station. Base station files for post-processing acquired locally (off-site Continuous Operating Reference Station) will be verified for accuracy.

1.6.2 Survey Report

Provide the Government with the survey data, collected in a digital format and with an attached hard copy survey report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, quality control report and field survey data.

1.6.3 Survey Control Database

Provide a digital Survey Control Database consisting of a survey marker database and a survey traverse database, for all survey control points established under this Contract. Include the horizontal and vertical order and coordinate location of each point.

1.7 CADD DATA

CADD data includes but is not limited to attribute (annotation) and vector data of the planimetric features included on Appendix 01 78 30.00 23-1, PLANIMETRIC FEATURES FOR CADD. Each planimetric feature is identified as a point, line, or area feature.

CADD drawings shall be in accordance to Appendix 01 78 30.00 23-1 PLANIMETRIC FEATURES FOR CADD and the requirements of the A/E/C CAD Standard (publications ERDC/ITL TR-09-2 and ERDC/ITL TR-04-1). These standards can be obtained at http://www.wbdg.org/ccb/browse_org.php?o=78 Contract deliverables incorporating CADD data shall meet the following guidelines:

a. The Industry Standard model file and sheet naming conventions, consisting of a Discipline/Code Designator, Drawing Type Code, Sheet Type Code/Designator, and Sheet Sequence Identifier shall be used for all submissions - diagrams of this naming convention can be found in the A/E/C CAD Standard.

b. Submittals shall include any standard sheets (abbreviations, symbols, fonts, etc.) necessary for a complete project, and document any nonstandard fonts, tables and symbols that are used.

c. Submittals shall include templates, plot files, pen assignments and Color-Dependent Plot Style Tables (CTB) files used to generate CADD layouts.

d. Files which are used as external references (XREFs) to share drawing information and are applicable to the project shall be included.

e. Files shall be drawn full scale (scale 1.0). Hardcopies of each site may be printed at any of the following scales:1 inch = 40 feet. The plot shall be made such that the site plan occupies as much of the page as possible.

1.7.1 CADD Feature Attributes (Annotation)

The Contractor shall identify minimum attribute data specified by the

Government for new, updated or edited features, first by field verification and then by existing sources.

Minimum attribute data to be collected, and stored in the CADD files as annotation for the included features are, where applicable:

a. Feature Description
b. Feature Classification
c. Feature Type
d. Elevation
e Material Type
f. Location
g. ID Number

1.7.2 CADD File Format

Provide drawing files in AutoCAD 2010DWG file format. No other CADD format is acceptable. Drawing files shall be full files, uncompressed, and unzipped.

1.7.3 CADD File Orientation

Each CADD file shall be drawn in model space, and georeferenced (oriented such that items are located at their true State Plane Coordinate System (SPCS) coordinates). The coordinates shall be in the U.S. Survey Foot unit of measure using Northing and Easting Coordinates consistent with the SPCS for the region of Naval District Washington. Horizontal coordinate system for Naval District Washington region is NAD83 and vertical coordinate system is NAVD88. Orient the drawing such that North is pointing at the top of the screen.

1.7.4 Vector Graphics and Raster Files

The CADD files shall be in vector form only. The files shall be created using vector entities. Scanned and raster files may be used only for referencing purposes. If used, insert raster files as attachments in a separate layer and include a world file (WLD) with georeferenced coordinates. Refer to Appendix A of the A/E/C CAD Standard for layer naming conventions.

1.8 DATA INTEGRITY

The Contractor shall employ appropriate quality standards to ensure that data is topologically correct, accurate, and complete to include:

a. Point and line features must be snapped together where appropriate to support networks. Linear features must not break for labeling or other aesthetic purposes.

b. Lines and line strings which represent the same graphic element must be continuous (i.e., not broken or segmented), unless that segmentation reflects a specific visual line type. Lines/strings representing the same type of data must not cross except at intersections.

c. Straight lines must be represented by only the beginning and ending x- and y-coordinate points. Line strings must not cross back on themselves or be of zero length.

d. Polygons must be closed (i.e., the first x- and y-coordinates must exactly match the last x- and y-coordinates). Each polygon must have a single unique centroid to which attributes (i.e., an attribute table) can be attached. Polygons of the same coverage must not overlap and must cover the area of interest completely (i.e., have no gaps or slivers in coverage).

e. The digital representation of the common boundaries for all graphic features must be exactly the same, regardless of level/layer. Each feature within a map theme must be represented by a single graphic element (e.g., polygon, line, or line string).

1.9 RECORD DRAWINGS

The record drawings and CADD Data provided by this specification section shall not be considered as-built drawings for the overall construction project but can be used to support and is in addition to any required as-built deliverable requirements.

Record drawings shall be prepared in accordance with Section 01 78 00 CLOSEOUT SUBMITTALS.

In addition, record drawings shall clearly indicate the following mandatory information:

a. Location and elevation of new lines, conduits, valves, fire hydrants, meters, terminal points using at least two ties to permanent points (manholes, power poles, curbs, or storm-sewer water inlets), or GPS coordinates with accuracy to at least 0.5 feet, or better if more stringent accuracy requirements are specified in other sections of this Contract.

b. Location and elevation of underground structures and utilities including but not limited to, potable water pipelines, wastewater and storm-sewer water pipelines, electrical conduits and lines, grounding rods and cables, telephone lines, CATV and fiber optic lines, and various process pipelines.

c. Distance measurements of new lines from property easement lines or edges of pavement shall be shown at intervals of 300 ft.

d. All utility routing and interface changes indicated clearly on the drawings to scale and defined with sufficient dimensions.

e. Elevation contour lines shall be shown at 1.0 foot interval. Indicate high and low points with spot elevations.

The extent of the CADD data deliverable will be considered as the Limit of Disturbance.

1.9.1 Underground Utility Location Plan

The Contractor shall prepare and submit an Underground Utility Location Plan with the input of a Registered Land Surveyor.

Indicate in the plan the method used to horizontally and vertically locate new underground utilities, lines, and conduits provided as a result of this Contract, including change orders, addendums, and modifications. Include provisions to locate new underground utilities prior to

backfilling. The plan shall be composed on ANSI A sheets (8 1/2 by 11 inches) only; no legal sheets are allowed.

The plan shall include as a minimum:

a. A cover sheet with the Project title and Contract number.

b. Name, address, and phone number of Contractor.

c. Name, address, and phone number of company performing the survey work.

d. A full description of the method used for locating new underground utilities for the survey.

e. Printed name and signature of the Contractor's Project Manager.

f. Printed name, signature and stamp of the Registered Land Surveyor.

Submit 3copies of the Underground Utility Location Plan prior to performing any construction work. The plan shall not be considered as an acceptable means of location until approved by the Contracting Officer. The Government will not define the Contractor's method of locating underground utilities.

1.10 GOVERNMENT REVIEW

Data deliverables shall be submitted for review and approval via compact disk read-only memory (CD-ROM) or digital versatile disk read-only memory (DVD-ROM).

The Government will review the submitted data and documentation for accuracy and completeness before acceptance. Review period for the Government will be 14 days. The Contractor will have 14 days to make corrections and produce the final data deliverable. Missing or incomplete items will be documented and forwarded to the Contractor for completion. Failure for non-compliance of the specifications outlined in this document, will result in non-acceptance of data deliverables and the withholding of invoice payments for 100 percent of the Bid Item cost identified at contract award or as modified by contract modification. To avoid rejection of final data deliverables, the Contractor is urged to submit data and documentation samples at 25 percent and 75 percent completion.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

Appendix 01 78 30.00 23-1 PLANIMETRIC FEATURES FOR CADD

.DWG File	Common Feature Name	.DWG Layer Name
Communications.dwg	Antenna Area	COMM-ANT~-OTLN
	Coaxial Lines	CABL-COAX-LINE
	Communication Line	COMM-LINE
	Fiber Optic Cables	CABL-FIBR-LINE
	Manholes	COMM-MHOL
	Pedestal	COMM-DEV-PED~
	Pullbox	COMM-PULL
	Sensor	COMM-SNSR
	Telephone Booth	COMM-BOTH
	Twisted Pair Line	COMM-TP~
	Underground Ductbank	COMM-DBNK-LINE
Contours_Topography.dwg	Depth Contour Line	TOPO-DPTH
	Elevation Contour Line	TOPO-ELEV
	Spot Elevation Point	TOPO-SPOT
nvironmental_Compliance.dw	Tank Area - Above Ground	FUEL-TANK-OTLN-H
	Tank Point - Above Ground	FUEL-TANK-H
	Tank Area - Under Ground	FUEL-UGND-OTLN-H
	Tank Point - Under Ground	FUEL-UGND-H
Hydrography.dwg	Shoreline	TOPO-SHOR
	Spring	WATR-SPRG
	Surface Water Body Area	WWAY-SURF
	Surface Water Course Centerline	RIVR-SURF-CNTR
Improvements.dwg	Bulkhead Line	EROS-BLKH-LINE
	Cemetery Area	CEME-OTLN
	Crane Area	SITE-CRNE
	Dam Area	HYDR-DAM~-OTLN
	Fence Line	SITE-FENC

.DWG File	Common Feature Name	.DWG Layer Name
	Gate Line	GATE-OTLN
	Gate Point	GATE-ACCS
	General Improvement Feature Point	SITE-GENF
	Levee Area	HYDR-DVDK-OTLN
	Miscellaneous Feature Area	SITE-MISC
	Revetment Area	EROS-REVT-OTLN
	Wall Line	SITE-WALL-LINE
	Weir	EROS-WEIR
In All DWGS	Installation Boundary	PROP-OTLN
Natural Resources.dwg	Forest Stand Area	SITE-TREE-OTLN
	Land Vegetation Area	LAND-VEGE-OTLN
Operations & Safety.dwg	Barricade Area	STRC-BRCD-OTLN
	Barricade Point	STRC-BRCD
Recreation.dwg	Athletic Point	SITE-EQPM
	Athletic Field	SITE-SPRT
	Boat Ramp Area	SITE-RAMP
	Picnic Area	SITE-PICN
	Playground	SITE-PLAY
	Recreation Park Area	SITE-PARK
	Recreation Trail Area	SITE-TRAL-OTLN
	Small Craft Marina/Pier/Dock	SITE-DOCK
	Swimming Pool	SITE-POOL
	Trail	SITE-TRAL-CNTR
Structures.dwg	Canopy Pavilion Area	CNPY-PAVI
	Carport Area	SITE-CARS
	Open Storage Area	OPEN-STOR
	Shed Area	SHED-OTLN
	Slab Area	SLAB-OTLN

.DWG File	Common Feature Name	.DWG Layer Name
	Structure Existing Area (Buildings)	BLDG-OTLN-E
	Tower Area	SITE-TWR~-OTLN
	Tower Point	SITE-TWR~
	Tunnel Area	SITE-TUNL
Survey Data.dwg	Control Point	SURV-DATA
	Survey Traverse Line	SURV-LINE
	Survey Traverse Point	SURV-TRAV
	Topographic Survey Data	TOPO-SURV
Transportation.dwg	Airfield Light Point	ALFD-LITE
	Airfield Safety Feature	ALFD-FLNE-MRKG
	Airfield Surface Centerline	ALFD-SURF-CNTR
	Airfield Surface Marking	ALFD-SURF-MRKG
	Airfield Surface Point	ALFD-
	Curb Line	ROAD-CURB
	Dolphin	WWAY-DLPH
	Footbridge Area	BRDG-SWLK-OTLN
	Jetty	WWAY-JETY
	Median Area	ROAD-MEDN
	Mooring Area	SITE-MOOR
	Navigational Aid Point	AFLD-SIGN
	Pedestrian Sidewalk Area	SWLK-OTLN
	Railroad Centerline	RAIL-CNTR
	Road Area	ROAD-OTLN
	Road Bridge Area	ROAD-BRDG
	Road Centerline	ROAD-CNTR-LINE
	Road Feature Area	ROAD-FEAT-OTLN
	Road Feature Line	ROAD-FEAT-LINE
	Road Feature Point	ROAD-SIGN

.DWG File	Common Feature Name	.DWG Layer Name
	Road Guardrail Line	ROAD-GRAL-LINE
	Sea Plane Landing	SEAP-LAND
	Sea Plane Ramp	SEAP-RAMP
	Vehicle Driveway Area	DRIV-OTLN
	Vehicle Parking Area	PRKG-OTLN
	Vehicle Surface Marking Area	ROAD-MRKG-OTLN
	Vehicle Surface Marking Line	ROAD-MRKG-LINE
UT_Air.dwg	Compressed Air Pipeline	CAIR-PIPE
	Compressed Air Valve	CAIR-INST
UT_Electrical.dwg	Guy Wires & Anchor	ELEC-POLES-GUYS
	Circuit Breaker	ELEC-PROT-DEVC
	Electronic Recloser	
	Electronic Sectionalizer	
	Fault Interrupter	
	Hydraulic Recloser	
	Hydraulic Sectionlizer	
	Relay Recloser	
	Fuse	ELEC-FUSE
	Open Point: insulated and shielded devices that connect high-voltage cables to apparatus, including transformers.	ELEC-OPEN
	Riser	ELEC-RISR
	Support Structure - Pole/Tower	ELEC-POLE-TWR~
	Pole	
	Tower	
	HFrame	
	Push Brace Pole	
	Other Support Structure	
	Switch	ELEC-SWCH

.DWG File	Common Feature Name	.DWG Layer Name
	Duct Bank	ELEC-DBNK
	Direct Buried	
	Conduit System:	ELEC-SUBS-OTLN
	Main Station	
	Relay Station	
	Skid Mounted Sub Station	
	Sub Station	
	Switching Station	
	Exterior Light	ELEC-EXTR
	Generator	ELEC-GENR
	Grounding Point	ELEC-GRND
	Meter	ELEC-INST
	Primary overhead lines; single or three phase	ELEC-PROH
	Primary underground lines; single or three phase	ELEC-PRUG
	Secondary overhead lines; single or three phase, overhead streetlight	ELEC-SCOH
	Secondary underground lines; single or three phase, underground streetlight	ELEC-SCUG
	Surface Structure:	ELEC-SUBS-OTLN
	Connection Box	
	Enclosure	
	Non-Electric Enclosure	
	Pad	
	Pedestal	
	Panel	
	Storage Tank	

.DWG File	Common Feature Name	.DWG Layer Name
	Transformer:	ELEC-XFMR
	Network	
	Power	
	Padmount	
	Step	
	Transformer - Overhead	ELEC-XFMR-OH
	Transformer - Underground	ELEC-XFMR-UG
	Junction Box	ELEC-JBOX
	Manhole	ELEC-MHOL
	Handhole	ELEC-HHOL
	Pull Box	ELEC-PBOX
	Vault	ELEC-VAUL
UT_Fuel.dwg	Fuel Oil Pipeline	FUEL-LINE
	Fuel Pump	FUEL-EQPM
	Fuel Pump Booster Station	FUEL-EQPM-STAN
	Fuel Tank	FUEL-TANK-OTLN
	Fuel Hydrant	FUEL-HYDT
	Oil/Water Separator	FUEL-DEVC
UT_Gas.dwg	Abandoned Gas Pipe	NGAS-PIPE-ABND
	Main Line	NGAS-PIPE-MAIN
	Meter Point	NGAS-INST
	Non Controllable Fitting	NGAS-FTTG
	Regulator	NGAS-EQPM
	Service Line	NGAS-PIPE-SRVC
	UG Enclosure Access	NGAS-INST
	Valve	NGAS-PUMP
	CP Test Point	NGAS-ANOD-TEST
UT_Heat_Cool.dwg	CP Anode	HTCW-SPLY

.DWG File	Common Feature Name	.DWG Layer Name
	Fitting	HTCW-FTTG
	Main Line	HTCW-PIPE-MAIN
	Steam Line - Service	HTCW-PIPE-SRVC
	Meter Point	HTCW-INST
	Pump	HTCW-PUMP
	Control Valve	HTCW-VALV-CTRL
	System Valve	HTCW-VALV-SYSM
	UG Enclosure Access	HTCW-JBOX
	Underground Enclosure	HTCW-JBOX-OTLN
	Utility Area	HTCW-UTIL-OTLN
	Utility Marker	HTCW-UTIL-MRKR
UT_Industrial.dwg	Industrial Waste Pipe	INDW-LINE
	Industrial Waste Pump	INDW-EQPM
	Industrial Waste Tank	INDW-TANK
	Industrial Waste Valve	INDW-VALV
UT_Storm_Sewer.dwg	Storm-Sewer Drainage Pipe	STRM-PIPE
	Culvert Pipe	STRM-CIPR
	Headwall	STRM-HWLL-LINE
	Storm-Sewer Junction Box	STRM-JBOX
	Inlet	STRM-INPR-OTLN
	Discharge Point	STRM-DISC
	Storm-Sewer Valve	STRM-VALV
	Ponds, Catch Basins, & Treatment Measures	STRM-DRAN-BASN
	Oil/Water Separator	STRM-OIL~-OTLN
UT_Wastewater.dwg	Force Main	SSWR-PIPE-MAIN
	Gravity Main	SSWR-PIPE-GVTY
	Lateral Line	SSWR-PIPE-LATR
	Clean Out	SSWR-FTTG

.DWG File	Common Feature Name	.DWG Layer Name
	Wastewater Inlet Pipe	SSWR-INPR
	System Valve	SSWR-VALV
	Manhole	SSWR-MHOL
	Meter Point	SSWR-INST
	Vent	SSWR-VENT
	Pump Stations	SSWR-EQPM
	Grit Chamber	SSWR-GRIT
	Pretreatement Device	SSWR-GT~~
	Pretreatment Device	SSWR-DEVC-OIL~
	Pump	SSWR-PUMP
	Pump Station	SSWR-PUMP-STAN
	Septic Tank	SSWR-TANK
	Service Area	SSWR-SRVC-OTLN
	Utility Area	SSWR-UTIL-OTLN
	Treat Plant	SSWR-PLNT
	Aerated Lagoon	SSWR-LAGN
UT_Water.dwg	Main Line	WATR-PIPE-MAIN
	Water Pump	WATR-EQPM
	Water Pump Station	WATR-EQPM-STA~
	Meter Point	WATR-INST
	Production Structure	WATR-PROD-STRC
	Pump	WATR-PUMP
	Relief Valve	WATR-VAVL-RELF
	Sampling Site	WATR-SMPL-SITE
	Service Area	WATR-SERV-OTLN
	Service Line	WATR-PIPE-SRVC
	Storage Structure	WATR-TANK
	System Valve	WATR-VALV-SYSM

.DWG File	Common Feature Name	.DWG Layer Name
	System Valve	WATR-VALV-PIV
	Control Valve	WATR-VALV-CTRL
	UG Enclosure Access	WATR-JBOX
	Utility Area	WATR-UTIL-OTLN
	Utility Marker	WATR-MRKR
	Fitting	WATR-FTTG
	Water Fire Connection	FIRE-DEVC
	Water Fire Line	DOMW-FIRE-LINE
	Hydrant	WATR-HYDT
	Hydrant	WATR-HYDT-OTHR
	Water Treatment Plant	WATR-PLNT

-- End of Section --